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ABSTRACT

An International System for the Exchange of Information on Science and Technology for Policy-making, Management, and Development (SPINES) was established to provide a decentralized international system for information exchange between member states which collect, process, and disseminate basic data on science and technology with special emphasis on applications to development. This report describes the goals of the system, summarizes activities from 1970 to 1976, reviews operational features, introduces planned activities for 1977 to 1982, and details issues to be discussed at the 19th general conference of UNESCO. (EMH)

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Item 16 of the Provisional Agenda

AN INTERNATIONAL SYSTEM FOR THE EXCHANGE OF INFORMATION ON SCIENCE AND TECHNOLOGY FOR POLICY-MAKING, MANAGEMENT AND DEVELOPMENT (SPINES)

SUMMARY

Resolution 2.123/(a) adopted by the General Conference at its eighteenth session requested the Director-General to prepare a "report and a proposed resolution for consideration by the General Conference at its nineteenth session, on the establishment of a Science and Technology Policies Information Exchange System (SPINES), in accordance with the recommendations of the UNISIST programme".

The present document responds to that request. It is mainly based (i) on the recommendations adopted by the Meeting of Experts appointed by governments on the establishment of the SPINES system which took place on 17 and 18 October 1975; (ii) on the results of the third session of the United Nations Committee for the Application of Science and Technology to Development which met in New York from 2 to 20 February 1976. The Meeting of Experts itself was preceded by three consultations carried out during Spring 1975 by the Unesco Secretariat viz.: (i) the National Commissions for Unesco in all Member States; (ii) the members of the UNISIST Advisory Committee; (iii) the International Council for Science Policy Studies (affiliated to the International Union for the History and Philosophy of Science (IUHPS) federated in the International Council of Scientific Unions (ICSU)).

In the conclusion of this report, the Director-General proposes that instead of creating immediately a fully fledged SPINES system, the period 1977-1982 be devoted to the implementation of a SPINES Prototype Programme limited to volunteer countries, international organizations and national organizations. This proposal is reflected under resolution 2.122 and its work plan appearing in the Draft Programme and Budget of Unesco for 1977-1978 (document 19 C/5, paragraphs 2046-2051) and under the Objective 10.1 in the Draft Medium-Term Plan (document 19 C/4, paragraph 10125). However, the growth of the resources allocated to Objective 10.1 during the Plan period should be increased in order to secure the implementation of the SPINES Prototype through the Regular Budget.

Point for decision: Section V.

IR003910

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Annex II

I. TERMS OF REFERENCE OF THE SPINES SYSTEM

1. Present world situation

The last two decades have witnessed a remarkable increase in the importance attached to science and technology policies both as part of the management at the government and other levels, and as a field of study. While the need for an efficient access to world literature in the field of science and technology policies is more acute in countries which have only recently established governmental science and technology policy structures (the creation of such structures was assisted by Unesco in more than 22 Member States during the last 15 years) and in university departments or units for science policy studies, such a need is also increasingly felt by the large industrialized States, whether by governments, parliaments, large science-based enterprises, academic institutions or national research organizations, and has also been officially recognized by a number of international organizations, both within and outside the United Nations family of organizations.

Several international bodies including the United Nations General Assembly and the Economic and Social Council, have recently drawn the world's attention to the present inadequacies of international information exchange on the management, transfer and assessment of science and technology and their application to development. A number of isolated attempts have been made over the past years to create information systems in this field at the national level, but most of them failed because the "critical size", i.e. the minimum number of annual input references needed to sustain a computerized information system, had not been attained. There exist, however, in a few Member States, classical documentation services providing bibliography lists or newsletters, but they are generally limited in coverage and scope and do not respond to the urgent needs of developing countries.

The need for a system like SPINES arises from the difficulties inherent in mastering the information relevant for science and technology policy-making, management and development which are as follows:

this information is spread over numerous disciplines and is disseminated in a wide range of documents, many of them issued by non-commercial publishers;

rather sharp barriers exist in this field between the specialists of different countries or regions;

the field is steadily widening and the character of the information is often highly technical, hence it is difficult to locate the expert knowledge and advice necessary for its interpretation and use;

the increasingly rapid obsolescence of much of the information;

the absence of either a national information infrastructure or a national data bank for the application of science and technology to development in many Member States.

It should be noted that such an information system covering on one side all the fields of science and technology for policy-making, management and development, dealing on the other side with the political, social, economic and cultural aspects of science and technology policy does not exist anywhere in the world, despite the fact that several attempts or proposals have been made at the national and international levels in this connexion. (e.g. in the United States of America, Canada, the Parliamentary Assembly of NATO, the European communities). As a result, most countries conduct ad hoc bibliographical studies as needs arise in development planning, or crises occur which call for policy decisions in the field of science and technology. Few information services on science and technology policies exist at the country level and they often duplicate each others' work; furthermore they are far from being exhaustive (subject areas and/or coverage of existing literature) and they are limited to the publishing of bibliographical lists or abstracts (examples are the monthly bibliography issued by the Union of Soviet Socialist Republics Academy of Sciences, the Battelle Science Policies News which ceased to appear in 1972, and the MIT Bulletin). At the international level, existing channels and services do not allow for compatible exchange of information on ongoing R&D projects and on development projects calling for the application of science and technology.

2. Objectives

SPINES aims at establishing a decentralized international system for information exchange between Member States which would collect, process and disseminate basic bibliographical and

numerical data on science and technology policies in general, with a particular emphasis on all aspects of the application of science and technology to development.

From a survey conducted by Unesco in 1972 among the national science and technology policies making bodies in the Member States and the teaching and research units devoted to this subject in the European region, it emerged that 78% of the policy-making bodies, 86% of the teaching and research units affirmed that they needed access to an international information exchange system in the field of science and technology policies. These organizations represent what could be called the "core users" of the SPINES system; they are far from contributing the whole potential clientele of that system.(1)

The SPINES Thesaurus - which will appear during Summer 1976 - has been conceived so as to permit the indexing of: (i) the literature dealing with all aspects of science and technology policies; (ii) documents dealing with research and experimental development projects; (iii) literature and projects dealing with development in general, and more particularly those which call heavily on the application of science and technology.

3. Principles

In the light of the United Nations General Assembly's resolutions on a New International Economic Order (resolutions 3201 and 3202 (S-VI)) and on the International Strategy for the Second Development Decade (resolution 2626 (XXV), and the ECOSOC resolution 1902 (LVII)) on the "rôle of an international technological information system in the transfer and assessment of technology and in the indigenous growth of appropriate technologies in developing countries", the SPINES system is based on the following principles:

(i) Member States and international organizations should be assisted in the sharing of the literature and basic data which they produce on questions relating to science and technology policy-making, as well as to the management, transfer and assessment of science and technology, and their application to development;

(ii) developing countries must enjoy a greater flow of information permitting the selection of scientific advances and new technologies suited to their specific needs, and the appraisal of possibilities of adapting them to local conditions;

(iii) a science and technology policies information exchange system should be addressed to the above needs. It should be based on voluntary participation of Member States and international or national organizations as regards information input; the output of the system should be made accessible to all Member States and to the participating organizations. It should be conceived as both a bibliographic and a numerical data system;

(iv) such a system should be developed within the conceptual framework of UNISIST;

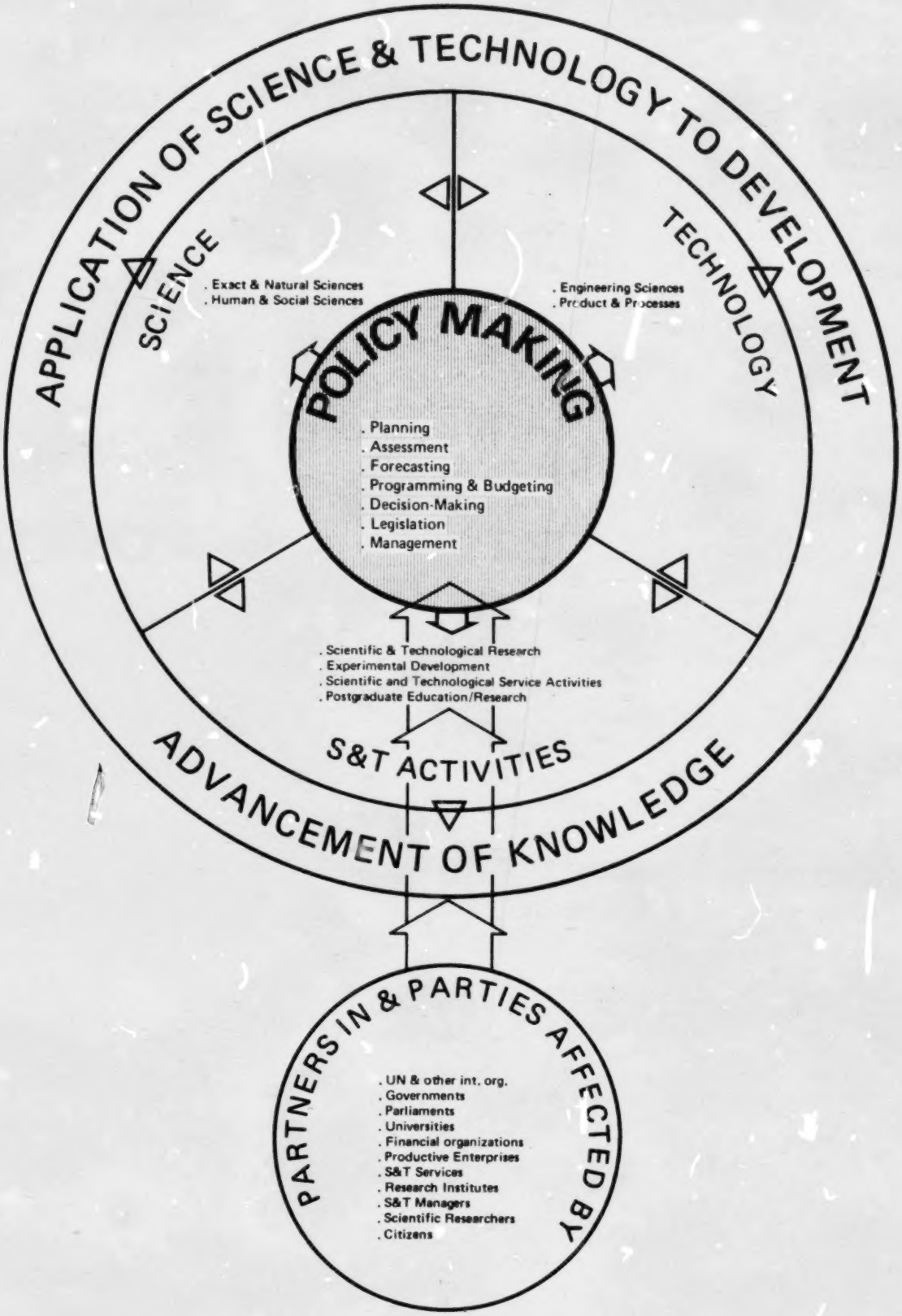
(v) financing should be ensured partially by Unesco on its Regular Budget and partially through extra-budgetary sources.

The SPINES system has been conceived and developed within the conceptual framework of UNISIST, taking advantage of existing United Nations information systems and thesauri. It is foreseen that - besides national contributions - input to the SPINES system will include the important documentation produced by the United Nations, its affiliated bodies and Specialized Agencies, as well as documentation produced by other international organizations in the field of science and technology policies, concerning all aspects of the application of science and technology to development.

In the Draft Medium-Term Plan, the SPINES system constitutes one of the programme actions planned to help secure Objective 10.1 "Development and promotion of information systems and services at the national, regional and international levels". More exactly, it comes under Sub-objective 10.13 "To assist in the development of information infrastructures and specialized international information systems", and is included in paragraph 10125 of document 19 C/4. The impact that may be expected from it, in its particular specialized area described above, is that assigned to Sub-objective 10.13, paragraph 10122 of 19 C/4.

(1) The diagram below (page 5) is an attempt to visualize both the conceptual coverage of the SPINES Thesaurus and those types of organizations and individuals who are the partners in and the parties affected by the SPINES system.

**CONCEPTUAL COVERAGE OF THE SPINES THESAURUS –
USERS OF THE SPINES SYSTEM**



II. SUMMARY OF THE PREPARATORY PHASE 1970-1976

1. Before the eighteenth session of the General Conference of Unesco

As far back as 1970, the General Conference of Unesco adopted a resolution promoting the exchange of information in the field of science and technology policies. This resolution was soon followed by the first preparatory steps undertaken by the Secretariat towards the progressive establishment of a world-wide information exchange system known under the acronym SPINES, in the field of policy-making and management of science and technology, in particular their application to development.

As far as Unesco is concerned, the following main steps preparatory to the establishment of SPINES were achieved in 1974 by the time of the eighteenth session of the General Conference:

1970-1971 -

methodological background studies for the building and the operational use of a multilingual thesaurus within the framework of an international system for the exchange of information on science and technology for policy-making, management and development. On the basis of these reports, the UNISIST Guidelines and other advice, the Unesco Secretariat undertook the construction of the SPINES Thesaurus and the exploration of the other elements of an information system;

compilation of a preliminary version of the science and technology policies thesaurus by a team headed by Dr. J.B. Poole (Scientific Section, Research Division, House of Commons Library, United Kingdom);

1972-1973 -

critical examination of the preliminary version of the thesaurus by the Unesco Secretariat and by specialized documentation centres;

experimental indexing of 3,800 documents with the preliminary version of the thesaurus conducted by the Unesco Secretariat with the co-operation of five indexing groups (in Belgium, Bulgaria, France, Poland and the United Kingdom). The Unesco Secretariat undertook the storage of the data on computer supports and produced frequency lists of the descriptors used during the test;

systematic collection of terms conducted by the specialists of the Unesco Secretariat and by outside experts for a number of specialized fields;

1973-1974 -

recompilation of the thesaurus by the Unesco Secretariat. The co-ordination of the construction of the new thesaurus was entrusted to B. de Padirac, Dr. Econ., (France); a number of contributors took part in the work;

surveys of the users and of the amount of literature produced each year in the fields of science and technology policies; publication of a world provisional list of periodicals dealing regularly or occasionally with science and technology policies;(1)

publication of the Feasibility Study on the SPINES system;(2) its preparation was entrusted in 1973 to an international team composed of the following consultants:

Dr. H. Coblans (United Kingdom), Chairman, formerly ASLIB (Association of Special Libraries and Information Bureaux); J. Ducrot (France), Manager, Data Processing and Information Service, Institut Textile de France; E. Houtart (Belgium), Director, Centre de Recherche et Documentation Juridiques (CREDOC); and L. Rolling (Luxembourg), Head, Information Technology Division, European Communities;

(1) Provisional World List of Periodicals dealing with Science and Technology Policies. Paris, Unesco 1974. 112 p. (series "Science Policy Studies and Documents" No.33(2)) - (on sale).

(2) Science and Technology Policies Information Exchange System (SPINES) Feasibility Study. Paris, Unesco 1974. 105 p. (series "Science Policy Studies and Documents" No.33(1)) - (on sale).

adaptation and testing of the INIS computer software developed by the International Atomic Energy Agency (IAEA) for loading, correction, development and printing of the thesaurus by computer.

2. Since the eighteenth session of the General Conference of Unesco

(a) Consultations conducted by the Secretariat on the establishment of the SPINES system

Three consultations were conducted by the Unesco Secretariat during Spring 1975, respectively of: the National Commissions for Unesco in all Member States, the members of the UNISIST Advisory Committee, and the International Council for Science Policy Studies (of the International Union for the History and Philosophy of Science, a body affiliated to ICSU). These consultations were focused on the technicalities of the SPINES system and aimed at eliciting suggestions about modifications that might be desirable in the design of the SPINES system as proposed in the SPINES Feasibility Study. The results of the consultations were in most cases and for most of the characteristics of the system favourable to the SPINES system as proposed by the international team of consultants headed by Dr. H. Coblans. In this connexion, it should be mentioned that out of 54 replies received from the National Commissions by 2 September 1975, 38 were favourable to SPINES, 9 unfavourable, 5 not in a position to reply, 2 not yet in a position to participate in the SPINES system if the latter were to be launched immediately. A number of countries firmly supported SPINES and indicated their willingness to participate in the system namely: Belgium (who expressed an interest - under certain conditions - in hosting the SPINES Central Processing Group, provided that the system received the approval of the General Conference), Brazil, Bulgaria (who offered in addition to serve as a SPINES regional unit), Czechoslovakia, Egypt, Hungary, India (who indicated also interest to serve as a SPINES regional unit), Jordan, Mexico, Sri Lanka, Sudan, Thailand, Union of Soviet Socialist Republics. The importance of SPINES for all countries, more particularly for the developing ones, was stressed. Nine countries expressed disagreement or reservations about the SPINES system: Austria, Canada, Denmark, Finland, France, Sweden, Switzerland, United Kingdom, United States of America. The arguments forwarded by one or more of these countries mainly concerned the lack of need and demand for SPINES; the absence of appropriate national information infrastructure; the unnecessary complexity of SPINES; the probability of a negative cost/benefit ratio; the financial modalities of the SPINES system.

(b) Consultation on the forthcoming Programme and Budget of Unesco for 1977-1978

This consultation launched in April 1975 gave, as regards the Project 2.123.1 of the Approved 18 C/5, the following results: a large number of Member States indicated their interest and/or support for SPINES: 21% of answers were in favour of an expansion of the activity; 60% in favour of its continuation; 14% were in favour of a reduction or abandonment of the SPINES programme.

(c) Meeting of experts appointed by governments on the establishment of the SPINES system (17-18 October 1975)

The Director-General invited the governments represented on the UNISIST Steering Committee to appoint the experts. Most of the sixteen appointed experts also represented their country on the UNISIST Steering Committee. Six countries sent observers (Brazil, Egypt, German Democratic Republic, Poland, Senegal, Spain) and ten international organizations (three United Nations organizations, four intergovernmental and three non-governmental). Moreover, five consultants with high-level responsibilities in the development of information systems or information infrastructures took part in the meeting.

A division of opinions similar to the one reflected in the consultation of the National Commissions appeared during the meeting between experts from different regions or countries. However, a formal and unanimous consensus emerged at the end of the meeting to recommend to the Director-General (i) the launching of a SPINES Prototype Programme during the period 1977-1982 and, irrespective of the future of SPINES, (ii) the maintenance of the SPINES Thesaurus, and the monitoring of its co-ordinated multilingual development according to the UNISIST guidelines. (See Annex I which reproduces the relevant sections of the Final Report of the Meeting of Experts.)

(d) The printing and distribution of the SPINES Thesaurus

The computer development of the SPINES Thesaurus took place in January 1976. The English source version (three volumes) has been published and distributed during Summer 1976,(1) pursuant to resolution 2.123(b) adopted by the General Conference at its eighteenth session. It contains approximately 10,500 terms, of which about one-third are unauthorized descriptors, and some 74,000 cross-references of all types, i.e. seven cross-references by term on an average. Volume I contains the rules conventions and directions for use; Volume II contains the alphabetical structured list; Volume III consists of the 34 terminological graphic displays.

(e) Ongoing co-operation of Member States with Unesco

The Library of the Hungarian Academy of Sciences and the Council for Scientific and Industrial Research (India) has accepted to undertake on a voluntary basis some experimental activities preliminary to the launching of the SPINES Prototype Programme. The results of these activities will greatly benefit the other volunteer countries who will join this Programme in 1977-1978. It will also help the SPINES management unit to prepare technical guidelines for the selection and indexing of information relevant to SPINES.

(f) It should be noted that the United Nations Committee on the Application of Science and Technology to Development, at its third session (New York, February 1976) re-emphasized the urgent need for appropriate mechanisms allowing the exchange of information on science and technology for development and in areas such as transfer and assessment of technology. The Committee decided moreover to establish an Interagency Task Force on Information Exchange and Transfer of Technology, to prepare a report which will be submitted directly to the Economic and Social Council at its 61st session. With respect to this universal acceptance of the importance of information systems in the process of science and technology transfer, the SPINES system represents a major contribution towards the progressive establishment of international co-operation and co-ordination of efforts in this field.

III. OPERATIONAL FEATURES OF THE SPINES SYSTEM

1. Infrastructures

The SPINES system has been devised in a decentralized way comprising:

(a) a Central Processing Group (CPG) which will be an autonomous body preferably located outside Unesco and established under agreement between Unesco and the host Member State or international organization;

(b) several national/regional units serving as relays allowing for the participation of volunteer countries to the input of the SPINES system.

2. Subject scope

SPINES being conceived as a world-wide system, the subject scope was determined, taking into account the different approaches - theories and practices - to science and technology policy-making and management, and to the application of science and technology to development currently adopted by the various Member States of Unesco. The documentary categories, adapted from the Feasibility Study for the proposed system, represent a basis for the delineation of the subject scope. Their list is given in Annex II.

3. Input

(a) National/Regional Units will be responsible for:

- the selection of the literature and numerical data;
- the acquisition of the documents;
- the cataloguing, indexing and abstracting of national/regional literature on the basis of the SPINES Thesaurus and according to the SPINES technical guidelines.

(1) Under No.39 in the Unesco Series, "Science policy studies and documents", Paris, Unesco, 1976.

(b) The Central Processing Group will be responsible for:

- the cataloguing, indexing and abstracting of the literature from international organizations;

- the supervision, co-ordination and standardization of the work of the National/Regional Units.

(c) Unesco will retain supervisory responsibility for the coverage of the SPINES Thesaurus and of the literature to be processed, and will also ensure that the UNISIST guidelines and principles are followed.

4. Processing

(a) National/Regional Units will be responsible for:

- the transfer of the standard coding sheets onto machine-readable medium if technically feasible;

- making suggestions for the updating of the Thesaurus.

(b) The Central Processing Group will be responsible for:

- the transfer onto machine-readable medium of:

  the literature from international organizations;

  the literature not transferred by National/Regional Units;

- the merging of magnetic tapes;

- the production of an abstracts bulletin (called "SPINIA");

- the maintenance of the Thesaurus.

5. Output

It is envisaged that all Unesco Member States will immediately benefit from the system as soon as it becomes operational:

(a) National/Regional Units will:

- supply original documents (one copy or microfiche of each document on request and at cost price);

- provide, according to their wishes, any information services except those provided by the Central Processing Group.

(b) The Central Processing Group will be responsible for:

- the dissemination of the SPINES merged magnetic tapes (one free copy per Member State);

- the dissemination of the SPINIA bulletin (one free copy per Member State);

- the supply of original documents from international organizations (one copy or microfiche of each document on request and at cost price).

6. Financing

National/Regional Units will be financed by the participating countries. The Central Processing Group will be financed partly from Unesco's regular budget and partly from extra-budgetary sources.

IV. CURRENTLY PLANNED ACTIVITIES: THE SPINES PROTOTYPE PROGRAMME 1977-1982

1. Principles of action

In light of the recommendations of the meeting of experts on the establishment of SPINES held in October 1975 and of the resolutions adopted by the United Nations General Assembly,(1) by ECOSOC(2) and by the Committee for the Application of Science and Technology to Development at its third session (New York, February 1976), the Director-General proposes to the General Conference of Unesco the launching of a SPINES Prototype Programme 1977-1982, based upon the following principles:

(i) volunteer co-operation of countries and international (or national) organizations to the input and financing of the management unit of the Prototype Programme;

(ii) participation of a limited number of national or regional SPINES units (eight to ten);

(iii) establishment of a small management unit of the SPINES Prototype Programme; possibly located outside the Unesco Secretariat;

(iv) concentration of the Prototype Programme on:

- elaboration and evaluation of models of national (or regional) SPINES units adapted to the requirements and wishes of Member States;
- training of indexers and retrievers to the use of the SPINES Thesaurus and of the SPINES technical guidelines for input, processing and outputs, and of the UNISIST guidelines for the treatment of information;
- maintenance and co-ordinated linguistic adaptations of the SPINES Thesaurus;
- production and dissemination of merged magnetic tapes produced under the SPINES Prototype Programme, and of an abstracts bulletin, e.g. SPINIA.

2. Main programme actions (1977-1982)

(a) Eight meetings of a small international team of specialists to advise and assist the national teams in charge of the preparation of French, Russian, Spanish (and possibly also other languages) versions of the SPINES Thesaurus, in a co-ordinated way and in accordance with the UNISIST guidelines.

(b) Contracts or grants under the Participation Programme for the publication of translations into other languages of the English source version of the SPINES Thesaurus.

(c) Twenty technical advisory missions to Member States, upon their request, for the setting up of a SPINES input and/or output unit (national or regional).

(d) Three expert meetings (category VI) for the launching and management of the SPINES Prototype Programme.

(e) Convening of an intergovernmental conference in 1982 for the establishment of the SPINES system.

(f) Elaboration of conceptual and technical guidelines for the selection of documents which will constitute the input to the SPINES Prototype Programme.

(g) Assistance to the countries and international (or national) organizations volunteering for participation in the SPINES Prototype Programme with a view to identifying sources of their relevant input literature.

(h) Assistance to Member States, at their request, for the organization of SPINES information services responding to the specific needs of users.

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(1) United Nations General Assembly resolutions 3201 and 3202 (S-VI) of 1 May 1974; 3362 (S-VII) of 19 September 1975; 3442 (XXX) of 9 December 1975; 3507 (XXX) of 15 December 1975.

(2) ECOSOC resclutions 1901 (LVII) and 1902 (LVII) of 1 August 1974.

(i) Elaboration of technical guidelines to be used in the SPINES Prototype Programme for cataloguing, indexing and preparation of abstracts of the input literature; training sessions for indexers.

(j) Negotiation with the International Atomic Energy Agency on the utilization of its computer software to be used for the maintenance of the SPINES Thesaurus and for the production of a SPINES Prototype index (and possibly abstract) bulletin.

(k) Contacts with relevant United Nations bodies and Specialized Agencies in order to ensure maximum compatibility and to maintain liaison with other United Nations information systems and data banks.

(l) Production of SPINES Prototype tapes and bulletins.

3. Cost of the SPINES Prototype Programme

(a) The SPINES Prototype Programme is to be found in the Draft Programme and Budget for Unesco for 1977-1978 under Section 2.12, II: "International Exchange of Information on the Application of Science and Technology to Development", proposed resolution 2.122, which should be referred to.

The Regular Programme ($40,000) (work plan, paragraph 2050) will provide for advisory services and the promotion of co-operation with a view to ensuring linguistic adaptations of the English source version of the SPINES Thesaurus into French, Spanish, Russian and into other languages at the request of interested Member States.

Negotiations will be undertaken with Member States and international and regional organizations soliciting them to participate in the SPINES Prototype Programme and to make voluntary contributions; on the basis of the results of these negotiations, action will be taken to launch the SPINES Prototype Programme.

(b) The biennial cost of the activities described above under IV "Currently Planned Activities: The SPINES Prototype Programme 1977-1982", starting with the 1979-1980 period, is estimated at $290,000. This sum covers staff costs (two programme specialists and secretarial services: $60,000) and programme costs (one meeting per biennium, one training course, consultants, travel and printing expenses: $120,000) $10,000 are, moreover, foreseen for participation in Member States' activities.

V. MATTERS ON WHICH DECISIONS ARE EXPECTED FROM THE GENERAL CONFERENCE OF UNESCO AT ITS NINETEENTH SESSION

The Director-General thinks it appropriate that the General Conference takes decisions on the following matters:

1. the authorization to launch the SPINES Prototype Programme 1977-1982, as foreseen in 19 C/5 Resolution 2.122 and its Work Plan (2046-2051), and along the lines described in this document;

2. the updating of the SPINES Thesaurus and its co-ordinated multilingual adaptation to the other official languages of the Organization, according to the UNISIST guidelines;

3. the inclusion of the Unesco programme actions concerning the development of SPINES (see Section IV above), in the Organization's Medium-Term Plan 1977-1982, is meant to reinforce the contribution towards Objective 10.1 "Development and promotion of information systems and services at the national, regional and international levels", and in particular Sub-objective 10.13 "To assist in the development of information infrastructures and specialized international information systems".

The additional financial implications for the total period of the Plan will amount to $500,000. The growth of resources allocated to Objective 10.1, which is a priority one, will increase from 6% to 7.4%.

ANNEX I

MEETING OF EXPERTS APPOINTED BY GOVERNMENTS
ON THE ESTABLISHMENT OF A SCIENCE AND TECHNOLOGY POLICIES
INFORMATION EXCHANGE SYSTEM (SPINES)

(Unesco House, Paris, 17-18 October 1975)

(Excerpt from the Final Report)

Paragraphs 12-18

V. TIME-TABLE

12. It emerged that a possible way of proceeding might lie in blending the two different perspectives which materialized during the general discussion. The wishes of those wanting early action might be met by their starting with a prototype programme along the lines suggested by those wanting a more simplified approach within the conceptual framework of UNISIST and with advice from the UNISIST Steering Committee on matters falling within its competence.

13. Objectives of the prototype programme would be:

(a) to elaborate this new and simplified approach in the light of comments made by experts at this meeting;

(b) to gain operating experience to be fed back to improve the design of the system and the effectiveness of operations; and

(c) to assess more accurately the volume, character and costs of operations.

14. The schedule of events might be as follows:

(i) establish the range of countries, international and national organizations or individuals wanting to participate in such a prototype programme;

(ii) plan and negotiate with such participants the scope of their participation;

(iii) develop an inventory of user information and data requirements leading to the formulation of a model to be used in the design of a national unit;

(iv) formulate specific operational guidelines including specification of technical, financial and organizational arrangements; preparation of training activities and materials; designing approaches to be considered in promoting the programme; and specifying criteria to be employed in evaluating the effectiveness and efficiency of the prototype programme;

(v) select national or regional units;

(vi) select an appropriate location for co-ordinating the prototype programme;

(vii) operate the prototype programme; and

(viii) evaluate and develop ideas for redesign.

15. Seven out of the twelve experts remaining recommended that the financing of the prototype programme should be allowed for within the Unesco Regular Budget while the other five felt that the question of funding was outside the terms of reference of the Committee.

16. Irrespective of the future of SPINES the meeting stressed that immediate steps should be taken to keep the thesaurus up-to-date and to ensure that any adaptation of the Thesaurus for use in other languages should be done in a co-ordinated way in conformity with UNISIST guidelines.

VI. BASIS FOR A RESOLUTION

17. The meeting recommended that the proposals in paragraphs 12-16 of this report be used as a basis for the draft resolution to be presented to the nineteenth session of the General Conference of Unesco.

VII. ADOPTION OF THE REPORT

18. The above report was formally and unanimously adopted at the close of the meeting.

ANNEX II

SPINES SYSTEM: DOCUMENTARY CATEGORIES

A. FOUNDATIONS OF SCIENCE AND TECHNOLOGY

A.10 Theory and systematization of science and technology

A.20 Philosophy and ethics of science and technology

A.30 History of science and technology since the nineteenth century

A.40 Sociology of science and technology

A.50 Economics of science and technology

A.60 Creativity and psycho-sociology of scientific researchers

B. SCIENCE AND TECHNOLOGY RESOURCES

B.10 Human resources for science and technology

B.20 Financial resources for science and technology

B.30 Scientific and technological information

B.40 Scientific and technological facilities and equipment

B.50 Institutional resources for science and technology

C. ADVANCEMENT OF KNOWLEDGE AND APPLICATION OF SCIENCE AND TECHNOLOGY TO DEVELOPMENT

C.10 Objectives, strategies, plans, programmes and budgets for science and technology

C.20 Forecasting and assessment in the field of science and technology

C.30 Transfer and implantation of science and technology

C.40 Legislation in science and technology

C.50 Economic, social and cultural impact of science and technology

C.60 International co-operation in the field of science and technology

D. PLANNING, ORGANIZATION AND MANAGEMENT OF SECTORAL R&D

D.10 Fundamental Research; multi-sectoral and other R&D

D.20 Medical R&D

D.30 Agricultural R&D

D.40 Environmental R&D (including oceanography and meteorology)

D.50 Space R&D

D.60 Industrial R&D (including construction, mining, transport, communications, etc.)

D.70 Energy R&D (including nuclear, solar and other non-conventional types of energy)

D.80 Defence R&D

D.90 Social, economic and cultural R&D